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FINANCIAL TIMES SURVEY

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BOSTON

Many major U.S. cities must envy the prosperity of Boston, which is now undergoing one of its periodic renaissances. The city's financial institutions have found a new lease of life and a wide range of high-tech manufacturers are now established in the area

OLIVER WENDELL HOLMES, the famous Chief Justice of the U.S. Supreme Court, once described Boston as the "hub of the universe," which is a pretty substantial statement to make about any American city, not least one which is only the twentieth biggest.

Today, even the most chauvinistic Bostonian would admit that Justice Holmes was overstating his case somewhat. Nevertheless, Boston remains one of the most vibrant and attractive cities in the U.S., and one which has had an influence on American affairs out of all proportion to its size. Recently, it has been among the most successful of U.S. cities in coping with the decline of its traditional industries.

By William Hall

Downtown Boston is gripped in a long-running development boom fuelled by the rapid growth of the city's financial services industries while ten miles or so outside the city, the parking lots are full and the loading bays are bustling at the "high - tech" companies clustered around Route 128, Boston's answer to Silicon Valley.

Boston, which less than a decade ago was suffering from chronically high unemployment, is undergoing one of its periodic renaissances and many major U.S. cities must envy its current prosperity.

When Justice Holmes was in his prime towards the end of the last century, Boston was a much more important place than it is today. The old "yankee" families, whose puritan roots stretched back to East Anglia, were still running the city, and had not forfeited their political grip to the offspring of the Irish immigrants who now hold sway.

Boston wealth, inherited from the days of "privateering" and the China Clipper trade, was financing the U.S. railroad boom and the country's expansion westwards, when cities such as Miami had yet to be founded.

The telephone was invented in Boston in 1876 and Boston figures of the day played a key role in developing the ideas and values of the young nation. Scions of well-known Boston families such as the Adams, Cabots, Lowells, Putnams, Lodges and many more played a very large role in the nation's early political and business affairs.

The period, around the turn of the century, marked a high point in Boston's influence, and for the next half century the city went into decline. At its peak roughly a third of America's textile industry and half of its shoe and leather industries were to be found in Boston and its neighbouring cities. But they have largely disappeared.

The textile companies fled south in search of cheap labour, the shoe industry was hit by imports, and Boston's great financial institutions fell into a deep slumber. Some of the better known names such as First Boston, Kidder Peabody and Paine Webber, escaped the city for New York.

For decades Boston seemed to be gripped in an irreversible decline. It took far longer to emerge from the Great Depression than other U.S. cities and for ten years after World War II the local economy appeared unable to replace the 1,000 jobs a month being lost in the textile industry.

By the mid-1970s, economists were openly pessimistic about the prospects for New England and its capital city, Boston. Between 1968 and 1975 alone, New England lost more than 200,000 manufacturing jobs.

Stuck in the north east corner of the country, with no natural resources to speak of, serious structural unemployment and a history of active trade unionism, Boston and its hinterland did not look as if it was ever going to shrug off its economic decline.

Factors behind the economic revival

However, 1975 marked a turning point. The number of job opportunities which had been steadily falling for years, started to climb. By the end of the decade Boston's unemployment rate had fallen well below the national average and the personal income of its workforce was growing faster than the country as a whole. What had happened?

Of all the factors affecting the region's turnaround, the spectacular growth of Boston's "high-tech" industries stands out. New England, and Boston, in particular, has received more than its fair share of Federal research and development spending and defence contracts.

However, generous Federal funding is not the only reason for Boston's economic revival. Jim Howell, the Bank of Boston's economist, argues that the factors underlying the birth of the American industrial revolution in New England in the early 19th century are the same ones that account for Boston's success in the high technology industries today. In particular, he cites the following:

- A plentiful supply of risk capital. In the old days it was the profits from overseas trade which provided the capital but now it is a new breed of Boston "venture capitalist." The city was the birthplace of America's post war venture capital industry, and in recent years close to a quarter of all U.S. venture capital investments have been made in the Boston area.
- An educational establishment, second to none. Harvard was founded only six years after the city of Boston itself and, according to the history books, "Harvard men predominated in the founding of the U.S."

Along with MIT, the two centres of learning stand at the top of a pyramid of 65 colleges and universities which make the greater Boston area, the "most knowledge intensive region" in the country. Boston's colleges, engineering laboratories and medical schools have provided both ideas and staff for several hundred "high-tech" companies clustered around the city.

- A plentiful supply of entrepreneurs willing to exploit new ideas. Ed Land, the founder of Polaroid, Ken Olson of Digital Equipment, and Dr An Wang of Wang Laboratories are some of the best known "high-tech" entrepreneurs leading the region's renaissance.

Economic and political awakening

CONTINUED FROM PREVIOUS PAGE

These companies, in turn, have spawned a fresh generation of young companies. Edson de Castro, for example, quit Digital Equipment to form Data General, one of the fastest growing companies in the information processing industry. Ken Fisher is another "high-tech" brain who recently left Prime Computer to set up Encore Computer. Boston is proving to be both a training ground and fertile seed bed for new ideas in America's "high-tech" revolution.

● Absence of unions. Boston has played a leading role in U.S. trade union history, but the whole revitalisation of the New England area has been characterised by companies which have not encouraged trade union activity. As these companies mature this could present a problem.

While Boston's economic revival is due in large part to the explosive growth of its "high-tech" industries along route 128, it is not the sole reason by a long shot.

The city's traditional financial institutions have also found a new lease of life. Boston was the birthplace of the U.S. mutual fund industry some 60 years ago, and, after a lacklustre period in the early 1970s, Boston's investment management industry is once again growing rapidly led by Boston firms such as the privately owned Fidelity Group which manages close to $20bn and is setting the pace nationally in terms of its aggressive marketing of new financial products.

Similarly, the Bank of Boston, which celebrates its 200th anniversary this year, is capitalising on its reputation as one of the most profitable and entrepreneurial banks in the U.S. Meanwhile, the traditionally conservative Boston Life insurance companies, like the John Hancock, are flexing their muscles and moving into new financial areas.

Boston's law firms and consulting companies export their services around the world, and these companies, when combined with the city's traditional financial community, have led to a rapid growth in demand for office space, which the developers have found hard to satisfy. As of mid-1983 there were eight new office towers under construction or planned which will add another 6m sq ft to the city's office stock.

Boston's economic renaissance has also coincided with the city's political reawakening after a long interlude when local politics were marked by by excesssive corruption and graft. Bostonians like to remind visitors that Massachusetts was the only state to vote for McGovern in 1972 when President Nixon was re-elected in a landslide victory, and it is the home of John F. Kennedy, a president who fired the ideals of the nation.

For years, the hostility between Boston's traditional "Yankee" families who controlled much of Boston's wealth, and the Irish political "bosses," led to virtually no development taking place in the city. But beginning with Mr. John B. Hynes, in the late 1950s a succession of Boston mayors began to work more closely with the business community and have presided over a radical transformation of the city's downtown area.

The spirit of co-operation between Boston's political and business communities has manifested itself in other ways. Boston businessmen talk proudly of the "Boston compact," where high school leavers are given job priority in return for an agreement that local schools raise their educational standards. The Bank of Boston recently gave $1.5m to Boston's public school system

—a gesture which would have been unthinkable 10 years ago.

While such initiatives are welcome signs of Boston's changing ways, they also point up one of the more serious problems the city faces in its bid to hold onto its above average prosperity. With its famous universities Boston may still think of itself as the "Athens of America," and the country's major seat of learning, bnt its public school system ranks among the worst in the country.

According to one local banker, close to two-thirds of the school children who fill in job applications at his bank, cannot complete the form.

Racial tensions

Another problem which has cast a long shadow over the city in recent years has been its racial tensions. The occasional ugly clashes over such issues as "busing," contrast with Boston's reputation as a liberal and tolerant city which led the abolition of slavery movement in the U.S. Seventy per cent of the city's population is white, the highest of any major U.S. city, yet the Boston Globe recently concluded that Boston shares with Miami the dubious distinction of being one of the most racially intolerant cities in the U.S.

Finally, the city of Boston suffers from unusually severe financial problems which means that the business community is always under pressure to provide more tax revenues. A few years ago Boston's "high-tech" industries in the guise of the Massachusetts High Technology Council, spearheaded a state-wide initiative to curb excessive state spending which culminated in the infamous "proposition 2½" which capped local taxes at 2½ per cent of local property values.

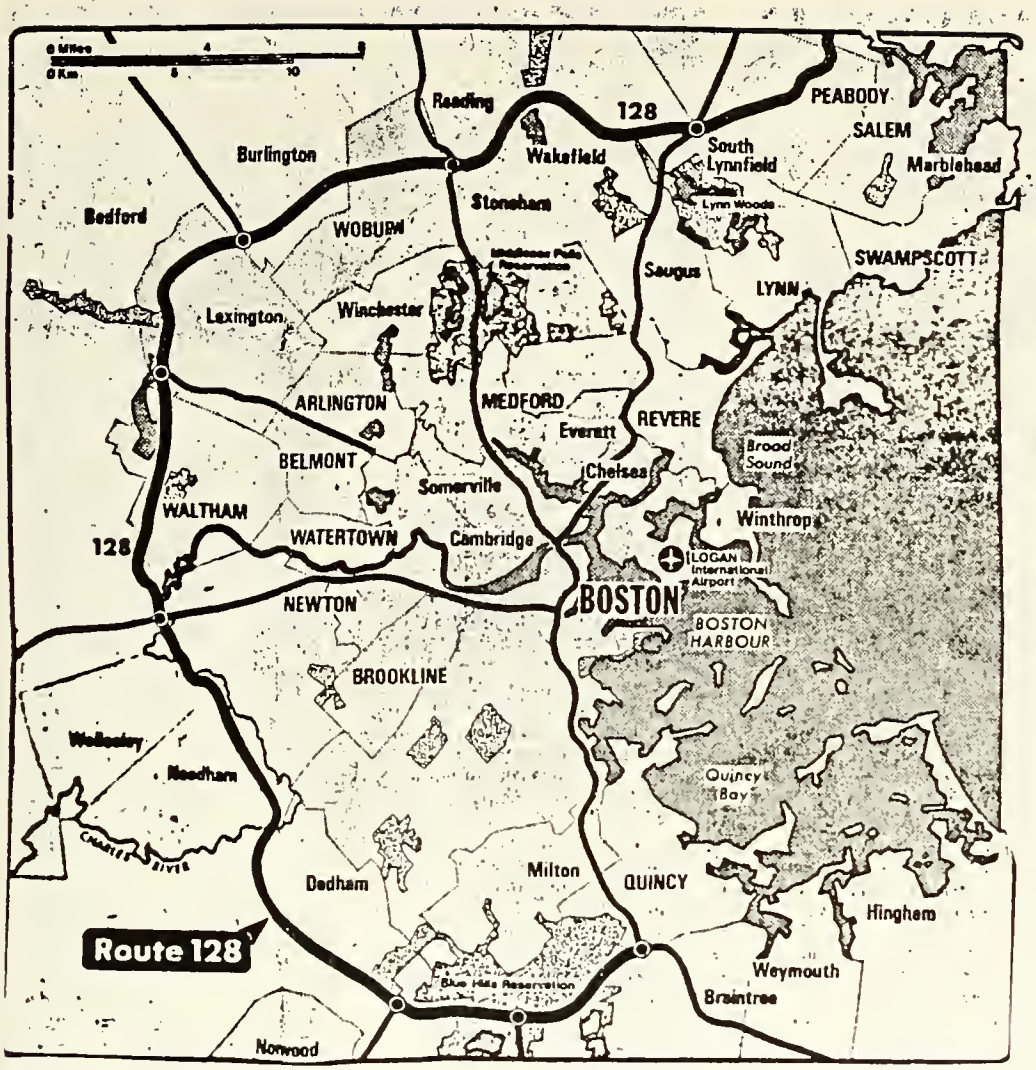
Boston, in common with other Massachusetts towns and cities, has still not fully come to terms with this initiative and the search is on to find fresh sources of revenues. At the state level, talk of a unitary tax is causing growing resentment among the "high-tech" companies who fear it will fall largely on them.

Despite the visible prosperity of its downtown area, Boston faces several problems in the coming years, not the least of which is ensuring that the fruits of the city's economic boom are spread more equally throughout the community.

After 16 years in charge of the city, Kevin White stepped down as Mayor earlier this year and has been followed by Ray Flynn, who promises to put a very different mark on the city.

At the state level, Gov Michael Dukakis, who came to power for the second time just over a year ago, promises to be more sympathetic to the city's financial problems than his predecessor, Ed King, who was backed by the business community.

Finally, at the spiritual level, the Most Reverend Bernard F-Law will be installed as Archbishop of one of America's most Catholic cities, later this month. All three will play a key role in moulding the city's destiny over the next few years.



STATISTICS

	Greater Boston	Massachusetts	New England
Area (square miles)	1,269§	8,257	66,608
Population* (000)	2,763	5,781	12,325
Unemployment† (per cent)	5.8	6.9	5.8¶
Employment† (m)			
Civilian labour force	1.5	3.3	N.A.
Civilians employed	1.4	2.8	N.A.
Personal income ($m) (Jan-Sept)	44,027‡	54,112	116,390
Population growth rate (1970-80)	−4.7	+0.2	+0.8
Universities and colleges*	47	119	253
No. of companies in Fortune 500*	10	16	30
Tourist revenue*	$516.5m	$2.6bn	$5.6bn

* 1982 data. † 1983 average, not seasonally adjusted. ‡ 1981 data. § Figure before redefinition by the Massachusetts Planning Council. ¶ Excluding Massachusetts.

How Bostonians have made their mark on U.S. history

● Boston, the birthplace of the American Revolution, is one of the oldest cities in the U.S. It was founded by a group of Puritan settlers in 1630.

Greater Boston consists of 106 towns and suburbs and has a total population of 2.8m. Economic centre of New England and the capital of the state of Massachusetts, it is 206 miles from New York City.

● Bostonians who have made their mark on U.S. history include: John Hancock, Samuel Adams, Paul Revere, Benjamin Franklin, Ralph Waldo Emerson, Oliver Wendell Holmes, Robert Treat Paine, and hundreds of others. More recently, major political figures to emerge from the area include the Kennedys, House Speaker Thomas P. (Tip) O'Neill, and Elliot Richardson.

● The city has long been regarded as one of America's leading cultural centres. Apart from Harvard, MIT, Tufts and Boston University, there are over 60 colleges and universities in the Boston Metropolitan area, at which over 250,000 students are enrolled. There are more students in relation to population than in any other city.

● It is probably the leading medical centre in the U.S. Its 35 hospitals including Beth Israel, Brigham and Women's, Children's Hospital Medical Center, Massachusetts General, New England Medical Centre and University Hospital. They employ 27,000 people and attract $125m in research and development spending a year.

● Route 128, which encircles Boston, is the home of several of the fastest-growing high tech companies (Digital Equipment, Wang, Honeywell). Boston's universities have been breeding ground for such inventions as the magnetic core memory by An Wang at Harvard.

● Boston was the home of the first U.S. mutual fund, Massachusetts Investors Trust. It now ranks as probably the biggest U.S. fund management centre after New York, with 60 insurance companies, 19 commercial banks and more than 50 fund managers, handling over $80bn a year.

● General George Doriot, founder of the U.S. venture capital business, set up his first firm in Boston. The city now ranks as one of the most important venture capital centres in the U.S. with more than 50 firms.

● Logan Airport, Boston, was the second fastest growing major airport in the U.S. and is the second busiest trans-atlantic airport, handling 2m international passengers and 15m domestic passengers in its last financial year.

● Boston is an important publishing centre, with the old-established Boston Globe newspaper facing stiff competition from the Boston Herald, recently acquired by Rupert Murdoch.

Rivka Nachoma

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BOSTON 2

The city has gained 50,000 jobs since 1976

More signs of recovery

ALTHOUGH Boston's finances may still give the citizens some cause for concern, the same cannot be said for the local economy, which is thriving and fuelling the above-average growth of the whole New England economy.

James Sullivan, president of the Greater Boston Chamber of Commerce, argues that in terms of private development his city is "probably the fastest-growing in the U.S." with over $1bn a year of new construction undertaken within the city alone.

Alex Ganz, research director of the Boston Redevelopment Authority (BRA), says that the current year will be the best-ever in terms of completions of major office and hotel projects. "The city has gained 50,000 jobs since 1976 and plans to create another 80,000 over the next 10 years," says Mr Ganz.

Between 1930 and 1960 hardly a new hotel room or office was built in Boston as the city slipped deeper and deeper into economic recessions. But since 1961 the picture has changed dramatically, with major investment in hotel and office projects coinciding with the fundamental changes in the employment structure.

Starting with 20m sq ft of office space in 1960, Boston has since built another 35m sq ft, says Mr Ganz. In mid-1983 eight new office buildings were under construction, totalling 5.8m sq ft.

Since 1980, the number of hotel rooms has been increased by nearly a third and the number is scheduled to increase by another 20 per cent to 11,000 rooms by 1986.

Lewis Mumford, author of several important books on urban sociology, has described Boston as a city "butchered and eviscerated by throughways, parking lots, and embarrassingly impotent bureaucratic erections."

Sensitive to this kind of criticism, the Boston Redevelopment Authority notes that downtown projects under way and planned for 1983-86 account for only half the total, and investment in non-office buildings is the biggest component.

It also notes that a quarter of the money is being spent on converting or restoring old buildings. Bostonians are still proud of their old city. It is, after all, the place where the American Revolution began.

The latest addition to the Boston economy point to the development boom. The $500m Copley Place hotel, shops and office complex will transform the city's "Back Bay" area. Within a few years it will be joined by a much enlarged Hynes Auditorium which aims to capture for Boston a far bigger slice of the lucrative convention business.

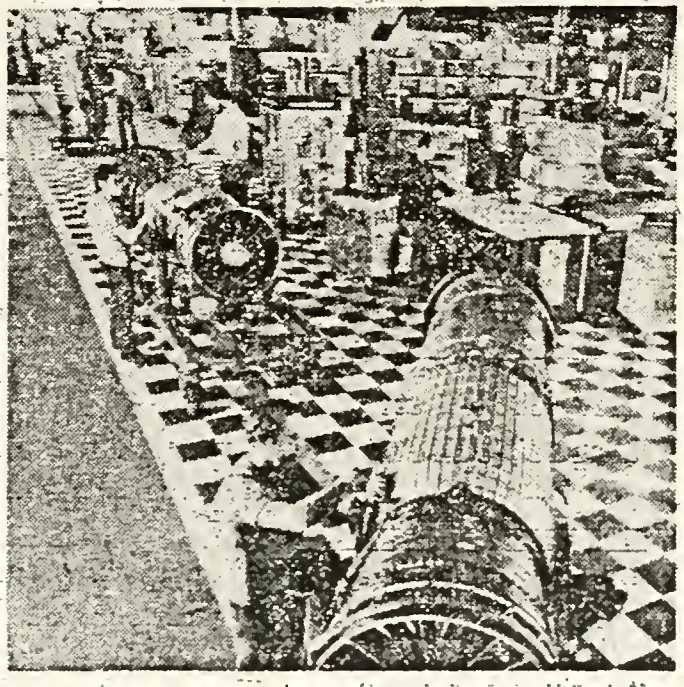
Meanwhile, down on the waterfront, work has begun on transforming the old Commonwealth Pier into a $150m international marketing centre for the computer and comunications industries. Known as Boscow, the development is believed to be the first of its kind in the world. Companies such as IBM and Xerox will take permanent stands and Boston is expected to attract 1m visitors a year.

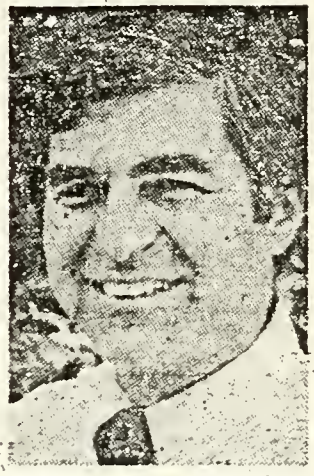
Planning is under way for a third harbour tunnel and related works in a $2.2bn project to ease the city's growing traffic congestion and prepare the ground for Boston's continued expansion over the next 20 years.

This economic buoyancy has enabled the city to handle substantial changes in employment patterns over the past three decades. In 1950 the proportion of the local workforce employed in the service industries was less than a third. Today it is more than half, the highest proportion of any major U.S. city.

The decline in the traditional industries has been more than offset by the growth of the "high-tech" industries in the suburbs and the financial services provided by the banks, insurance companies and fund managers in the central area.

For years unemployment in Boston was higher than the national average. In 1975, 12.8 per cent of the workforce was unemployed, compared with a national average of 8.5 per cent. Today, the unemployment rate is well below the national average and personal incomes have risen faster than in the nation as a whole for the past six years.





Massachusetts State Governor Michael Dukakis: more sympathetic to the city's financial problems than his predecessor, Ed King. Right: General Electric's aircraft assembly line at Lynn. High technology industry has helped to reduce unemployment to well below the national average.

Economic growth

WILLIAM HALL

City with a ticking time bomb

Finance

WILLIAM HALL

THREE YEARS ago Boston was teetering on the brink of bankruptcy. Moody's had suspended the city's credit rating, hundreds of policemen and firemen were laid off and schools were closed. Angry municipal workers caused traffic jams as they demanded that the police and fire stations be reopened.

During 1981 more than a fifth of the city's workforce was laid off and swingeing cuts were made in departmental budgets as the authorities came to terms with the infamous "Proposition 2½" which required Boston, in common with the rest of Massachusetts, to reduce its rate of property tax to a maximum of 2½ per cent of the value of the property.

As property taxes are Boston's main source of revenue (unlike other major U.S. cities) and were running as high as 10 per cent of property values when "Proposition 2½" was introduced, the city's financial predicament was dire.

Worse still, it coincided with another crisis resulting from the so-called "Tregor Decision," which found that the city had been over-assessing certain commercial properties for tax purposes and ordered the authorities to pay back more than $150m. For a few months in the summer of 1981 Boston appeared to be on the verge of financial collapse.

But Boston pulled through and last year it was able to return to the capital markets for funds. In the schools, where there was an estimated 13,000 empty places, the cuts forced a stubborn education commitee to close schools for which there was no longer any use, while still retaining one of the lowest pupil-teacher raios in the U.S.

Departmental "fat" in other areas absorbed some of the expenditure cuts, while the authorities were forced to look for new sources of revenue (such as parking fines) and the state of Massachusetts substantially increased its share of the city budget.

Boston has long had the reputation of being a spendthrift and its ever-growing appetite for property tax revenues was part of the reason behind the taxpayers' revolt in Massachusetts which culminated in the 2½ per cent "cap" on property taxes. Most citizens agree that the financial shocks of 1981 were a salutary experience and Boston is a leaner and trimmer city as a result.

But the financial problems are far from over. Despite a booming downtown economy, Boston's financial state is worse than that of many other major U.S. cities. Besides its unusually heavy dependence on a single source of tax revenue it is small in relation to the more prosperous metropolitan area which it services. (In 1980 the city's population was 563,000, whereas the metropolitan area had a population of more than 2.7m.)

Inferior

About half of all city property is exempt from tax and there is a disproportionate number of poor people. The bulk of Boston's expenditures are effectively fixed, so the mayor can control only a third of the city budget. This gives him little room for manoeuvre.

Jim Howell, the Bank of Boston's senior economist, is one of those who argued against "Proposition 2½." "There is no question that 'Proposition 2½' has made an already inferior education system more inferior," he says.

Sam Tyler, who heads the Boston Municipal Research Bureau, a watchdog body funded by the private sector, believes that the city faces a serious problem next year, with spending running some $40m above even the most generous revenue estimates. Other economists believe the gap is higher still.

Mr Tyler is worried that many of the workers laid off in 1981 have been rehired, and although it is early days with the new team at City Hall he fears that they might be falling back into Boston's bad old ways of spending the money first and hoping that the state of Massachusetts will bail them out before the lights go out.

With elections to the Massachusetts legislature due next year, state politicians are not likely to look kindly on the plea for yet more financial help unless City Hall can prove it has taken decisive steps to put its house in order. State aid to Boston has risen by 240 per cent over the past six years and now matches the property tax as a revenue source. Boston will be lucky to get a much larger slice in the short term.

In the longer term, Boston, in common with other Massachusetts municipalities, must get to grips with its rising pension costs resulting from an unfunded pension liability of $1.2bn. The annual cost of servicing the city's contributory pension scheme takes up more than 10 per cent of the city budget.

Mr Tyler, who is not prone to hyperbole, describes the pension problem as a "ticking time bomb." Without some change, "it will bankrupt the city on its own," he says.

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PROFILE: RAY FLYNN



Ray Flynn, the city's new Mayor, is a Democrat and a powerful member of Boston's Irish community. The business sector is believed to be happy with the new Mayor who has a strong rapport with the State Governor.

Quiet start for new Mayor

"IF YOU really want to know what is going on in Boston politics, you should get yourself an ouija board." This is the advice of one cynical observer of the city's murky political scene.

After an unprecedented 16 years in the mayor's office, Kevin White handed over to Ray Flynn last January and the change means that all the old alliances and associations which have driven local politics for years are again in the melting pot. The pundits have described the changeover as a watershed in Boston's political history.

Mr Flynn, 44, is a Democrat and a member of Boston's powerful Irish community. But there the similarity with his predecessor ends. Mr White was a flamboyant character,

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in Boston's political history.

Mr Flynn, 44, is a Democrat and a member of Boston's powerful Irish community. But there the similarity with his predecessor ends. Mr White was a flamboyant character, admired by some and hated by others who argued that Boston was one of the "great" cities of the world and should do things accordingly.

This attitude did not endear him to Massachusetts State legislators, who had to finance an increasing part of the city's overspending.

Mr White did wonders for Boston's image on a national and international scale. He played a leading part in fostering the downtown development boom and the restoration of such historic landmarks as the Maneuil Hall market place.

Mr Flynn, by contrast, was propelled to power on the back of a widespread feeling that his predecessor's concentration on downtown development at the expense of the neighbourhoods had been overdone. At first sight Mr Flynn appears to lack Mr White's charisma, but he is regarded as a genuinely decent man and he has pledged himself to make his administration as open as possible.

Black treasurer

Sensitive to accusations that his predecessors did not give enough jobs to blacks and other members of Boston's minorities, Mr Flynn has appointed several of them to leading positions in his administration. They include the city's first Black treasurer.

The grandson of Irish immigrants from County Galway and County Cork, the father of Mr Flynn was a longshoreman and his mother an office cleaner. After working for a time as a parole officer in his native South Boston, Mr Flynn served in the Massachusetts State legislature before becoming fully immersed in city politics, where he has taken strong stands on issues such as busing and abortion.

It is early days yet, but Mr Flynn is said to have a much healthier rapport with State Governor Michael Dukakis than some of his predecessors. This should benefit Boston in its battle for further state aid.

Mr Flynn has already dismantled a large part of his predecessor's public relations machine and abolished several departments in his attempt to cut costs. The business community is said to be happy with the new mayor, though some of its members fear that the new régime might make unrealistic demands on them.

WILLIAM HALL

Money managers' pride in long-term success

Investment management

WILLIAM HALL

Boston money was made early on in American history. It was made from privateering in the war of 1812, the China clipper trade of the 1830s and the cotton manufacturing trade of the 1840s and 1850s. Boston money was used to finance the development of the West and while there is still plenty of Boston money around, the city's financiers now manage money from all over the U.S., and increasingly from all over the world.

"Mr Johnson is not in the public eye; he does not have his name on a fund like Jack Dreyfus, and even the average Wall Streeter draws a blank. My friend Charley with a go-go fund of his own has to be reassured that there is a Mr Johnson." (*The Money Game*, by Adam Smith.)

ANYONE IN the Boston investment community will tell you that there is certainly a Mr Johnson, although he is retired now and the family owned Fidelity Group is run by his son. With around $20bn under management (including the Magellan fund, the "hottest" mutual fund on Wall Street), Fidelity is the biggest of a bunch of highly successful Boston-based fund managers.

While Boston-born securities firms such as First Boston, Kidder Peabody and Paine Webber deserted Boston for New York when they came of age, Boston's money managers have remained a major force in the city, clustered in the alleys around State Street.

Today, Boston manages more mutual fund money than any other city and in terms of funds under management probably ranks second only to New York, especially if the insurance companies are left out.

"Boston is where all the thinking is done in this country. It always has been," says TA Associates, Peter Brooke. Compared with the transaction-orientated mentality of Wall Street, Boston's money managers pride themselves on being a more reflective lot and this probably explains their long-term success.

George Putnam, chairman of the Putnam family of mutual funds and treasurer of Harvard (a successful investor in its own right) explains Boston's success as follows: "Because money has been passed down from generation to generation, there is an obligation to manage it well. The capital you inherit belongs to your children. You can use the income during your life but the capital belongs to them. As a result there has been a long tradition of professional money management here."

There are several types of money manager. The mutual fund managers are the best-known because of their extensive newspaper advertising But there are plenty of other managers. At one extreme are the banks and the big Boston insurance companies such as John Hancock Liberty Mutual and New England Mutual Life.

Apart from handling their own money they are also active pension fund managers and independent managers such as Fidelity, Putnam and Eaton Vance.

Less visible but still important are the Boston trust companies. Boston Safe and Deposit Company, which was recently acquired by Shearson American Express occupies an interesting niche in the market. It is one of the oldest banks in Boston but does no commercial banking business. Instead it manages billions of dollars ranging from mutual funds and pension fund money down to individuals.

It sees itself as very much the Boston equivalent of a private bank, like Coutts, which serves rich individuals — among other activities.

In Boston the law firms still play an active and successful role as trustees for family fortunes. "Trust companies feel they are hired not to lose money, whereas the private trustee feels he is hired to make money," says George Putnam in explaining why Boston money managers have been so successful over the years.

It was one of George Putnam's ancestors, Justice Samuel Putnam, who first gave Boston the impetus to become an important investment management centre. In 1830 he presided over a test case when Harvard University sued its trustees because they had bought common stock and the value had gone down.

Putnam upheld the trustees' decision and ruled that so long as a trustee invests as he would invest for himself, taking into consideration that income was a factor plus the prudent safety of principal it was perfectly acceptable for Harvard's trustees to buy equities.

This decision, known as the "prudent man ruling," ensured that Boston was a safe place for people to leave their money. It took New York City 100 years before it had such a ruling.

The next big step forward in Boston's development as an investment management centre was the birth of the U.S. mutual fund industry 60 years ago.

Merrill Griswold, a partner in a Boston law firm which handles trust accounts, is credited with establishing America's first mutual fund, Massachusetts Investors Trust, in 1942. Within the next six months two more mutual funds had been started in Boston.

George Putnam's father founded Incorporated Investors and Paul Cabot set up State Street Investment Corporation. All three men played key roles in the growth of the U.S. mutual fund industry over the following decades.

They were able to maintain confidence in their industry and encourage the growth of the mutual fund habit. Today mutual funds control nearly $300bn.

Boston's mutual fund industry, in common with other



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BOSTON FUND MANAGERS

Name	Funds under management ($bn)	Ownership
Fidelity Investment	20.0	Independent
Loomis Sayles and Co.	12.5	66% owned by New England Life Insurance
State Street Research and Management	12.0	Metropolitan Life Insurance
Putnam Management	12.0	Marsh and McLennan
Batterymarch Financial	11.3	Independent
Scudder, Stevens and Clark	11.0†	Independent
Massachusetts Financial Services	8.0	Sun Life Assurance Company of Canada (U.S.)
The Boston Company	6.1	Shearson-American Express
Keystone Massachusetts Group	5.0	Travelers Corporation
Eaton and Howard, Vance Sanders	3.0	Independent
Colonial Management Associates	2.5	Independent

† Discretionary money, excludes money market funds and cash management.

mutual funds, went through a rough patch in the early 1970s as the slump in Wall Street hit the largely equity-based mutual funds. But the start of the money market funds rescued them.

Mr Johnson's Fidelity Group was one of the first to understand and exploit the potential of these new funds which now account for over half of all funds under management. In 1974 it launched the Fidelity Daily Income Trust, the first money market fund to offer cheque-writing facilities. Since then it has notched up a string of other firsts which have given Fidelity a reputation as one of the most aggressive companies in investment management industry.

Advanced

In 1979 it moved into discount brokerage and now operates the second biggest discount brokers in the U.S. Its Fidelity U.S. account is one of the most advanced cash management accounts on offer, combining a money market mutual fund with discount brokerage, unlimited checking and a range of computerised asset management services.

Most recently, Fidelity has had permission from the U.S. Comptroller of the Currency to establish the Fidelity Bank and Trust Company. This will allow it to hold the pension fund assets as well as manage the money.

While Fidelity is the most aggressive of the Boston fund managers it is also one of the last truly independent operators. Most of the others have been acquired by larger financial institutions. Sun Life of Canada has bought Massachusetts Financial Services, Metropolitan Life has bought State Street, and New England Mutual has a majority interest in Loomis Sales.

TOP FIVE BOSTON-BASED BANK HOLDING COMPANIES

(year ended December 31 1983)

Holding company	Total assets ($m)	Growth rate	Net income ($m)	Growth rate (decrease)	Total deposits ($m)	Growth rate	Return on assets	Return on equity	Loan loss provision ($m)	Non-performing loans and lease receivables ($m)	As % of loans
Bank of Boston*	19,538.0	+ 7.0	135.7	+9.0	12,381.0	+ 6.0	0.72	14.44	54.0	326.0	2.7
Bank of New England†	5,800.9	+14.5	36.6	+2.7	4,887.4	+19.5	0.66	14.23	19.5	66.5	1.72
Shawmut Corporation	5,775.2	+ 7.1	33.0	(3.0)	4,298.7	+ 8.6	0.62	11.68	24.0	68.5	2.1
Baybanks	4,639.3	+25.1	32.0	(3.7)	3,921.2	+23.8	0.77	13.0	5.1	15.2	0.6
State St. Boston Corpn. and subsidiaries	4,044.4	+ 3.3	38.5	(21.3)	2,485.4	+ 1.0	1.03‡	18.3‡	4.7	5.4	0.39

* Announced a definitive acquisition agreement with Colonial Bancorp, a Connecticut-based bank holding company with over $1.3bn in assets; and RIHT Financial Corporation of Rhode Island, with over $2bn in assets. Agreement to acquire Casco Northern Corporation, the largest banking organisation in Maine with $659m in assets. Purchase an equity stake in the Chittenden Corporation, the largest bank holding company in Vermont with assets of $682m.

† Merger pending with CBT Corporation of Hartford Connecticut, with assets of $1.6bn. Agreement to acquire Maine National Corporation of Portland, Maine, with assets of $604m, subject to approval.

‡ Excludes from earnings the impact of the loss on the sale of subsidiaries of $2,510,000, net of taxes and related expenses.

A key 'port of call'

The venture capital sector

WILLIAM HALL

THE NAMES TA Associates; Greylock; Palmer Organisation; the Charles River Partnership; Burr, Egan and Deleage; Morgan, Holland; Matrix Partners and several more may mean little or nothing to the ordinary investor, but in the U.S. venture capital business these Boston companies are well known.

The city can fairly claim to be the birthplace of the U.S. venture capital industry, and although it has been overtaken by California in sheer numbers of venture capital firms, Boston is still one of the first ports of call for any U.S. entrepreneur with a good idea.

General Georges Doriot, who was teaching at Harvard in the late 1940s, is widely regarded as the industry's founder. With another Bostonian, Bill Coolidge, who was close to MIT, the two men decided that technology could not only be of use to the country but also very profitable.

They managed to raise some cash and set up American Research and Development (ADR). Like many venture capital companies it was not particularly successful in its early days but it finally began to prosper on the back of its investments in companies like Digital Equipment.

In 1972 ADR was taken over by Textron but it is still active in the Boston venture capital comunity and several of the city's better-known venture capitalists cut their teeth at ADR before moving on to set up their own firms.

Today, Peter Brooke of TA Associates is regarded as another founder of Bostonian venture capitalism. He began life as a commercial banker at the First National Bank of Boston and was an active lender to the infant "high-tech" companies before branching out on his own.

TA Associates (it received its initial backing from the Boston brokers Tucker, Anthony (hence the TA). It was set up in 1969, inviting outside investors to put up money for its first limited partnership, Advent One. It raised $4.3m and opened for business with the objective of "identifying emerging growth industries and investing capital in leading companies in those industries to obtain modest current income and above-average capital gains."

Fifteen years later the firm still adheres to this basic formula to guide it in its venture capital investments in North America and in most of the major industrialised countries in the world.

Soon after TA Associates got going the bottom fell out of the stock market; but despite the traumas, Advent One turned in a respectable performance, with investors receiving a return of 11 per cent compounded annually.

It was followed by Advent Two, which raised $8.1m in 1972 and over the next ten years was able to provide its investors with an overall return on capital of 32.1 per cent compounded annually.

One of its most spectacular investments was a £380,000 stake in Tandon Corporation, a manufacturer of computer disc drives. By mid-1982 this investment had risen 76-fold to $29m.

Like all venture capitalists, TA Associates has had its share of bad investments. But because investors pool their risks in limited partnerships the overall performance of the partnerships has rewarded investors well. Advent Two has been followed by Advents Three, Four and Five.

TA Associates' success in identifying good investment opportunities is reflected in the fact that Advent Five has over $165m to invest. The current programme expects to involve around 55 direct investments in small growth companies, which will be handled by 18 professionals.

TA Associates' experience has been mirored by several other well-known groups in Boston. Most of the players are small firms whose names are not well known outside the venture capital world.

Some big banks, such as Citicorp, have set up venture capital operations, but Peter Brooke believes that big institutions are at a disadvantage in that they find it difficult to give venture capital professionals the flexibility and compensation which the small firms can offer.

One famous Boston institution which would probably challenge this view is the city's biggest life insurance company, the $30bn John Hancock, which recently set up the John Hancock Venture Capital Fund Limited partnership.

This venture, believed to be the first of its kind, surprised even some of Hancock's executives by its success in raising nearly $150m from people wanting to invest in the venture capital industry.

Whereas TA Associates and the other small Boston venture capital firms place their investors' funds directly into infant companies, John Hancock, like all good insurance companies has decided to spread its risks and has chosen to invest one-third of the fund in a portfolio of other people's limited partnerships (of which Advent Five is one). The remianing two-thirds is being invested directly.

In these instances it invests alongside other well-known venture capital concerns and again limits its risk by matching its own assessment of a company's potential with the more experienced views of other venture capitalists.

D. Brooks Zug, a director of John Hancock Venture Capital Management, admits that when he started some of the potential investors in his fund had "very legitimate" doubts as to whether a big firm like Hancock could be as enterprising as the small "boutique" type operations.

His success in stilling their doubts is reflected in the sum of money raised (Hancock itself chipped in only $14m).

Mr Brooks Zug believes there is a real advantage in having a large institution like Hancock associated with small investments. From the company's point of view it helps to have a household name like Hancock among the shareholders when it starts thinking of going public through a share offering on the over-the-counter market.

"If it is good enough for Hancock it is good enough for me," is a thought which Mr Brooks Zug hopes to exploit in his attempt to win a useful share of the U.S. venture capital business.

Whereas Brooks Zug and Peter Brooke might disagree on the relative effectiveness of big versus small firms in the venture capital business, one problem they share is the growing difficulty in finding a good home for their money.

More than $10bn has been poured into U.S. venture capital investments in the past five years, while over $4bn was committed by investors in 1983 alone as word got round about the kind of returns being made on venture capital investments.

As a result, the pricing of venture capital deals has come under severe pressure and returns are slipping.

"People seem to think now that venture capital investing is as easy as falling off a log," Peter Brooke says of the new competition. "We are coming into a very diffcult period and investment returns are not going to be what they were."

Radical changes now under way

Banking

PAUL TAYLOR

BANKING in Boston is undergoing sweeping changes, radically altering the structure of the local banking market and expanding the financial products and services the major companies now offer.

The changes are in response to two separate but related developments. The most immediate are new competitive pressures in Boston, as elsewhere in the U.S. banking industry, from the non-banks like Sears, American Express and Merrill Lynch, foreign banks like Lloyds and Barclays of the UK, and the big "money centre" banks like Citibank and Bank of America.

These new competitors are posing a direct challenge to the established Boston banks in several distinct banking markets, including retail and commercial banking at the same time that interest rate deregulation and changes in Federal legislation are changing the very basis of banking and placing a premium on service quality, product range and lower distribution costs.

But the more dramatic and visible changes stem from Boston's role as the "financial capital" of New England, which is itself the centre of a bold and unique new banking experiment.

The "New England Experiment," as it is called, represents the first attempt to create a regional interstate bank network based on changes in state legislation which freely permit interstate mergers and acquisitions within New England but generally restrict entry by banks outside the region.

As such, it poses a direct challenge to current Federal geographic banking restrictions, has led to a spate of legal suits from banks outside New England, particularly those in New York, which are angry about being excluded. It is also seen as a potential model for regional interstate banking agreements elsewhere in the U.S.

In Massachusetts the new state legislation permits mergers and acquisitions between banks in any New England state with reciprocal legislation. But it contains an "anti-leapfrogging" provision which specifically excludes New York-based banks which own banks in other New England states from acquiring banks in Massachusetts.

In their wake the new laws, coupled with competitive pressures, have generated a massive move towards consolidation in the region. Currently about 12 major mergers are planned and more are expected.

"I think it is just getting strated," says Frank Morris, president of the Federal Reserve Bank of Boston. "I think some banks may be holding back because the constitutionality of the Massachusetts is being challenged."

If the new laws are upheld, Mr Morris believes that "over the next five or six years we will see a very substantial consolidation"—a move which he thinks might reduce the number of banks in the region by at least 10 per cent.

The push towards consolidation partly reflects pressures which determine that, for example, only the largest banks can afford to invest in electronic payment systems and benefit from economies of scale. But it is also seen by some bankers in Boston as a "stepping stone" preparing New England banks for the time when Federal interstate banking barriers come tumbling down and opening the whole of the market to the major money centre banks and others.

For the moment the major contestants in the first wave of mergers have been the larger New England banks—including those in Boston.

More plans

Among the planned mergers which have already been announced, Bank of Boston, the largest bank in the region and the 18th largest in the U.S., has agreed to acquire Casco-Northern Corporation in Portland, Maine, for $55m, Colonial Bankcorp of Waterbury, Connecticut, for $75m and RIHT Financial Corporation, Rhode Island's third largest bank, for $120m.

But the biggest planned merger involves the Bank of New England, the fourth largest bank in New England with $5.5bn in assets, and CBT Corporation, the holding company for Connecticut Bank and Trust Company, the third largest banking group in New England with $6.1bn in assets.

In February, CBT and Bank of New England announced plans to acquire Maine National Corporation, Portland's fourth largest bank, with $605m in assets, for $75m.

The new combined banking group will have 280 offces in the states and assets of $12.5bn, ranking it an easy second in the region after Bank of Boston, which has $19.5bn in assets.

Bank of Boston itself is in the final stages of completing a new strategic plan which will map out the future direction of the 200-year-old institution. Backed by its enviable reputation, its power as a regional money centre bank in its own right and its extensive foreign operations, Bank of Boston's major challenge is perhaps to retain its status and pre-eminence.

Mr Barry Allen a Bank of Boston vice-president, puts it simply: "We are the premier bank in New England and we want to stay that way and grow. New England is our base but we are also a major international bank."

The bank has been particularly successful in exploiting its local market — especially the growth of high technology companies in the area. Bank of Boston was one of the first banks in the U.S. to have a venture capital subsidiary and has remained a major lender to many of these companies.

The bank is also a major player in the wider U.S. domestic and international markets — mainly by virtue of developing particular niches. For example, it runs the ninth largest bank leasing company in the U.S., and the third largest stock transfer service.

Internationally, it business was founded on trade financing, but it has expanded to include a full range of services both to domestic and international customers — and a somewhat less welcome exposure to some of the troubled and less developed nations in Latin America.

In contrast the second tier in Boston's banking structure — the other four major market players — have more limited international horizons, although Shawmut Bank Corp recently completed the acquisition of Techexport, an export trading company with $17m in sales last year, and most of the other banks have some limited international exposure.

Generally, however, Boston banks have adapted to change by adopting a niche strategy. Among the other majors, Baybanks Inc, which like all Boston banks is a multibank holding company reflecting the still restrictive nature of intrastate branching regulations in Massachusetts, has successfully emphasised its retail banking business and now operates the largest retail network in Massachusetts.

State Street Bank, the smallest of the five largest Boston banks, has emphasised trust management, processing and other fee-generating services. Together these services last year generated between 60 per cent and 70 per cent of its profits compared with around 10 per cent for the average bank.

In particular, State Street has become a major player in the rapidly expanding new market for stock index products, operating two seperate stock index futures funds with total assets under management of around $200m and counting among its 15 or so major corporate pension fund investors such companies as IBM, Arco and GTE.

Speculation

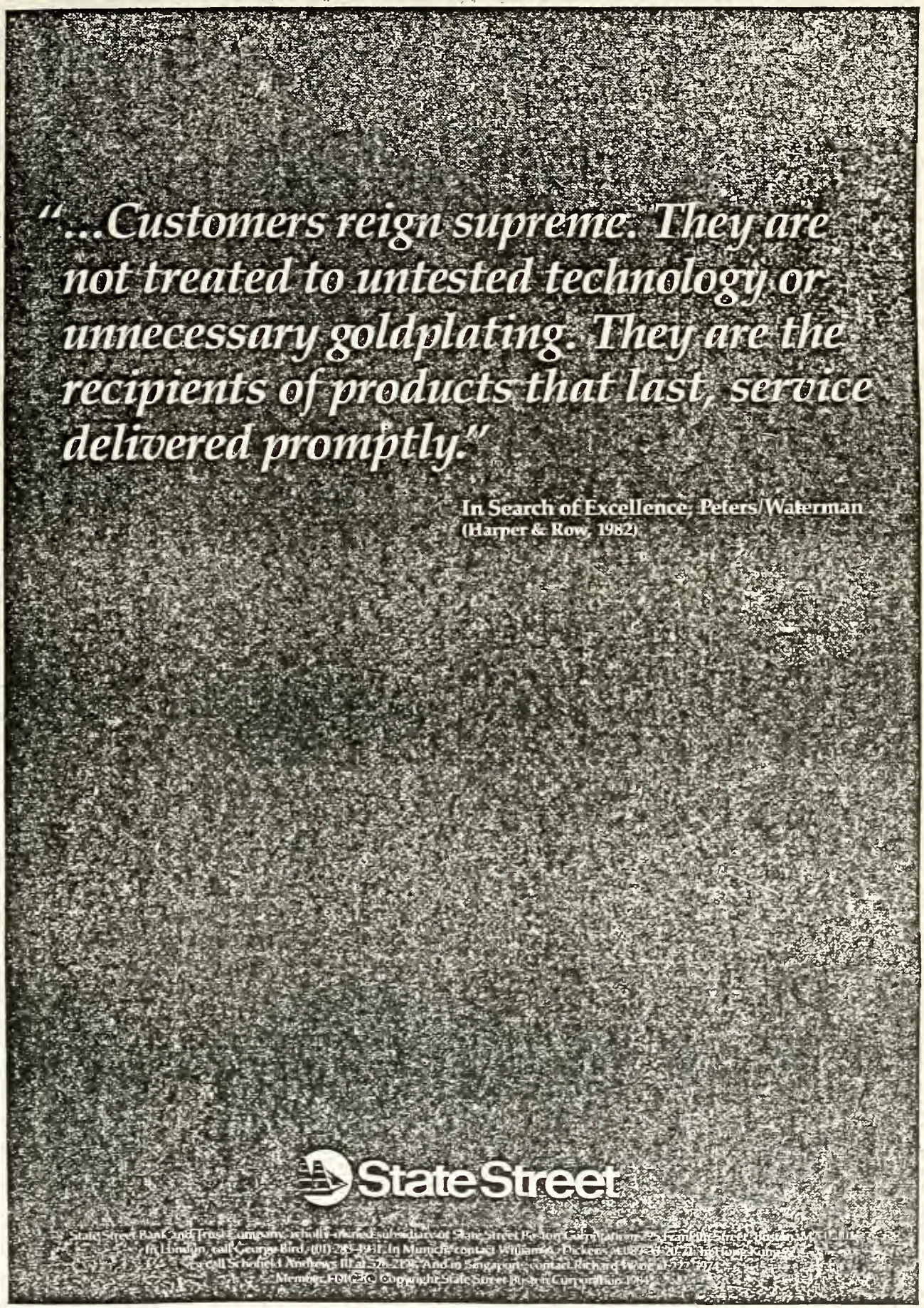
These attributes, together with the lively regional economy, have raised speculation that one or more of the major Boston banks could become the target for foreign bank acquisition. So far this has not happened, but a growing number of foreign banks, and banks from outside New England, are active in the local market—putting further pressure on lending margins.

Among the foreign banks with Boston operations, Barclay's Bank of the UK was one of the first to set up a branch in the city 12 years ago. Since then Barclays has been followed by two Canadian banks, one Israeli bank, a Greek bank, and by Lloyds, which opened an office in 1982.

Their positioning within the market has varied from bank to bank. Some like the National Bank of Greece, have concentrated on the ethnic market for retail and commercial banking services. Others have stressed commercial lending in the already fiercely competitive middle market, especially to high tech companies, and to the major multinationals to which they can offer extensive trade and other international banking services.

What is certain is that their presence, together with "loan production offices" for many of the major U.S. money centre banks and the strong and highly developed thrift industry in the region, is putting further competitive pressure on the indigenous Boston banks.

This pressure appears likely to maintain, if not accelerate, the pace of change in a historically conservative market.


"...Customers reign supreme. They are not treated to untested technology or unnecessary goldplating. They are the recipients of products that last, service delivered promptly."
In Search of Excellence, Peters/Waterman
(Harper & Row, 1982)
State Street

The Leader In Corporate Strategy

BOSTON CONSULTING GROUP

Basics

Today's great corporations exist and flourish because they are the best institutions yet devised to create value. Profit exists in the economic system only as a reward for value creation, and real profit exists in each business only because we are more successful than our competitors in delivering that value.

Real management — and real strategy — depends on proper attention to each of the three pieces of the profit equation:

- Creating value;
- Creating competitive advantage in delivering that value;
- Operating our businesses as well as can be done.

Good operations without competitive advantage will never produce outstanding profitability. The famous "charge of the Light Brigade" is a testament to leadership and operations without strategic advantage. Braniff seized the deregulation opportunity to capture new routes, and Seattle-First executed a massive loan expansion programme. Their failure is not a question of poor operations, but one of execution without strategy — action to capture opportunity without holding to the "basic" of sustainable competitive advantage. The steel industry will be better and stronger with good attention to operations. It will never be truly healthy without focus on businesses of sustainable competitive advantage.

At the same time, we are witnessing a rapid growth of new products, services, and technologies substituting for old. This is value creation. If the new did not create value, they would not substitute for the old. Maintaining and building competitive advantage in traditional areas without seeking new value creation is, like execution without strategy, a holding action only. Great positions of advantage like Friden in calculators, RCA in colour TV, Ford with the Model T, were eroded by the creation of new value through product technology, process technology, and marketing insight.

Finally, value creation without attention to sustainable competitive advantage is the hallmark of the entrepreneur, not the strategist. Freddy Laker capitalised on a brilliant insight, but one that was not competitively defensible against established airlines.

As the world changes, new needs arise and new opportunities come about to create value through cost reduction, better choices, higher quality. The world will reward whoever creates that value — whether traditional or new competitors. Business exists to create that value. That is the first basic.

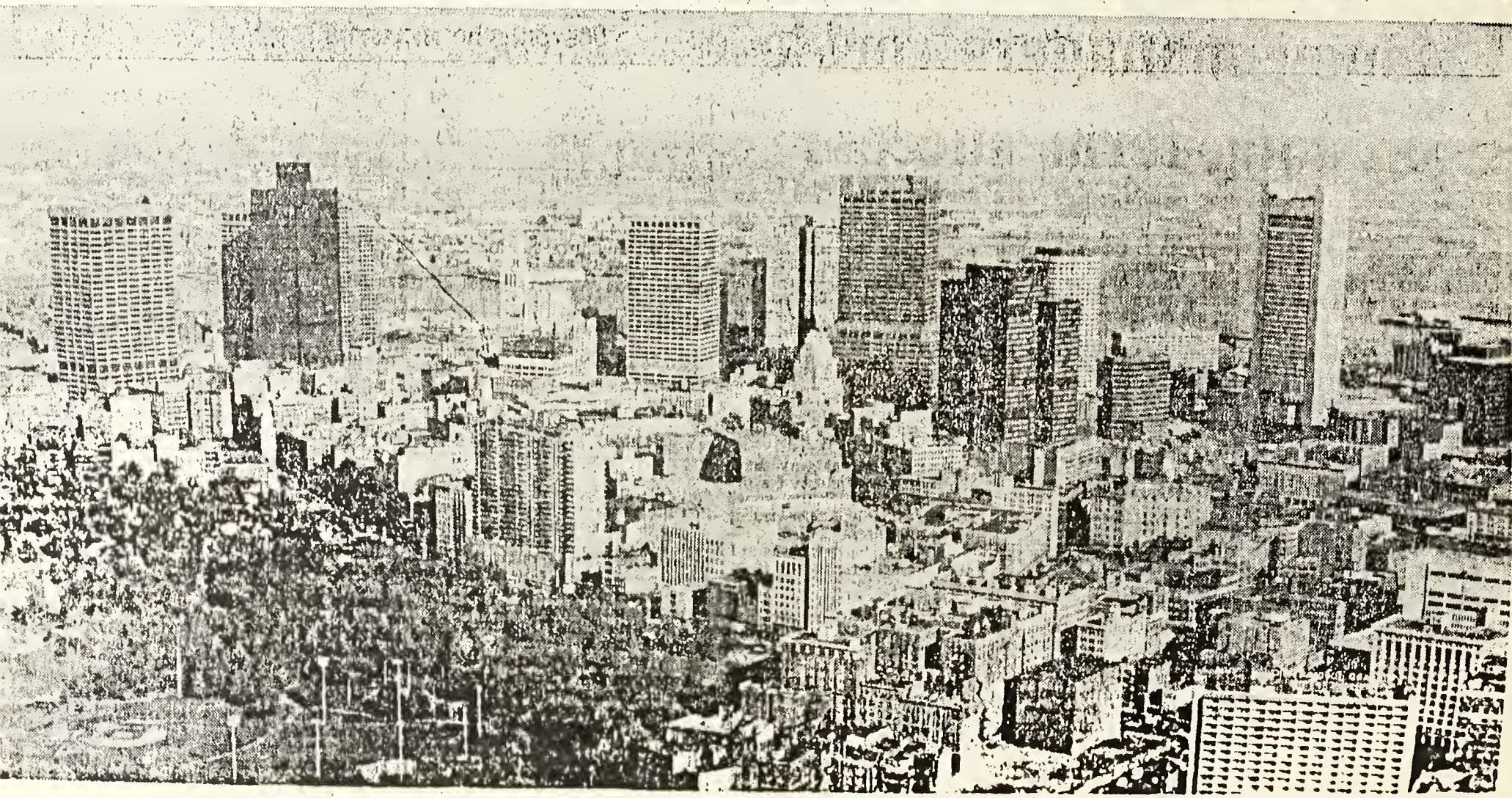
Profitability will be ordinary and perhaps transitory without sustainable competitive advantage. Leaping at opportunities without strategy inevitably means failure; in this context, strategy is the management of advantage. That is the second basic.

Good operating management is always valid, but it cannot substitute for the creation of value and competitive advantage. Without these it is a holding action at best and a smokescreen for obsolescence at worst.

Today's refrain of "back to basics" is dead right as long as we agree on what "basics" are. Attention to costs, people, customers, is part of good management. This attention will always pay dividends. But it is not enough. Worse, overattention to pieces of the management art can distract us from the real job — creating value.

In our zeal to find easy answers, quick fixes, specific actions, we may all have grasped at the straw of "back to basics" and in so doing, forgotten the real basic of business — build a better mousetrap and do it better than anyone else; that is, create value and maintain competitive advantage.

BOSTON 4



Boston, one of the oldest cities of the U.S., is now experiencing a development boom, plus substantial changes in employment patterns

Boston's booming high-tech sector is a key to the future prosperity of eastern New England

The envy of many other U.S. cities

High technology industry

PAUL TAYLOR

IN BOSTON they call it, with a certain pride, "knowledge-intensive manufacturing industry"; and they refer to the industrial belt between Route 128 and Route 495, which encircles the city, as the "Silicon Valley of the North East."

Such pride is understandable. The low, often plain-looking buildings which dot the rolling Massachusetts countryside to the north and west of Boston house a booming high-tech industry, which is a key to the transformation of the New England economy and the envy of many other states and other cities in the U.S.

The emergence of Boston and its environs as an area accommodating a broad selection of high-tech companies — ranging from computer and information processing concerns to those specialising in defence electronics, drugs, biotechnology, robotics and medical instruments — is seen as a crucial factor in the recent performance of the state's economy. Perhaps more importantly, it is also seen as the key to the future prosperity of eastern New England.

For example, although the region felt the effects of the recent recession they were relatively mild. In Massachusetts high technology companies now account for more than 250,000 jobs and over 40 per cent of total manufacturing jobs in the state.

Lynne Browne, vice president and economist of the Federal Reserve Bank of Boston, writing in the Fed's New England Economic Review, noted that "a major reason for New England's strong performance" during the recent recession "was high technology manufacturing."

The regional economy's disproportionate share of high-tech industry has, in the view of many economists, cushioned it against the worst effects of economic recession.

This concentration of high-tech industry, particularly around Boston, is immediately apparent from the corporate names on the buildings along Route 128 and from the list of companies with headquarters, or with major facilities, in the area.

'Big guns'

In the information processing field there are companies like Digital Equipment Corporation (DEC), the second largest computer company in the world after IBM; Wang Laboratories, the leading office automation concern which has headquarters in Lowell, Massachusetts; and Data General, the fast-expanding leader in the 32-bit "supermini" computer market.

They are the "big guns" of this new industry and they are growing fast. Last year Wang reported a 33 per cent increase in revenues to $1.54bn and a 42 per cent increase in earnings to $152m.

Mr John Cunningham, president of Wang, predicts that while the pace must slow — the company has grown at an annual rate of 47 per cent in the last four years alone — Wang "will continue to be the leader in office automation" and will have annual revenues of at least $5bn by the end of the decade.

In the applications market Computervision, headquartered in Bedford, Massachussets, has an estimated 23 per cent share of the computer-aided manufacturing business, and, says Martin Allen, the chairman, it expects to grow by 35 per cent a year over the next five years. Last year Computervision, which has customers like John Deer, Westinghouse, British Shipbuilders and a host of major car makers, reported earnings of $35.3m on sales which increased from $325m to $400m.

Among the emerging software companies are Cullinet, one of the largest independent vendors in this field, which has been growing at between 50 and 60 per cent a year; Lotus Development, which recently introduced its follow-up to its successful Lotus 1-2-3 integrated programme; and Spinnacker Software, which is carving a major slice of the expanding market for educational software.

Among the more established high-technology companies with major facilities in the area are Honeywell, Raytheon, Polaroid and General Electric. GE employs more than 13,000 people in the Boston area manufacturing aircraft jet engines, steam turbines, generators and precision gears.

TOP 15 EMPLOYERS
(in Boston area)

Company	City	No. of employees
Raytheon Cpn	Lexington	72,000
Digital Eqpmt	Maynard	67,100
Gillette Co	Boston	30,200
Stop & Shop Companies	Boston	29,000
J. Hancock Mutual	Boston	20,216
Wang Laboratories	Lowell	19,760
Liberty Mutual	Boston	18,791
Data General	Westboro	15,210
Poloroid	Cambridge	14,540
Bk of Boston	Boston	13,000
M/A-Com	Burlington	8,739
Eastrn Gas & Fuel Assoc	Boston	8,470
New England Mutual	Boston	8,218
Dennison Manftng	Framnghm.	8,200
Cabot Cpn	Boston	7,500

Research: Rivka Nachoma

The latest wave of high-tech companies to set up in the area include biotechnology concerns like Biogen, Genetics Institute and Damonbiotech, robotics manufacturers like Automatix and a growing number of concerns exploiting current research into "artificial intelligence," or "thinking computers."

Many reasons are given why Boston and Massachusetts have been so successful in attracting, nuturing and — at least so far — in keeping these new industries. The most frequently cited are the intellectual heritage by such excellent institutions as Massachussett Institute of Technology (MIT) and the world-famous University of Harvard at Cambridge, Massachusetts. The availability of funding nad the generally favourable environment are also of great importance.

Neville Lee, senior regional economist at the Bank of Boston, lists the following as key factors in the growth of science-based institutions in the region.

- An exciting agglomeration of high technology companies which provide a market for new companies.
- An industrial base with many companies at the innovative stage of development which can act as incubators.
- The presence of scientific and technological research institutions involved in "state of the art" development, university faculties and advanced private enterprise laboratories.
- The relatively low production costs in New England, which has the lowest "real" wages in the U.S.
- The availability of venture capital to finance start-up and expansion.
- A willingness to foster and reward technical enterprise.
- Skilled and experienced workers.
- The region's ability to attract Federal Government procurements of advanced defence technology.
- An enterprising and energetic banking system ready to encourage and promote innovation and further growth.

Industrial leaders cite a similar set of reasons, placing particular emphasis on the benefits in terms of sheer brain power which accrue from having

47 universities and colleges in Greater Boston alone.

The close relationship which exists between the academic world and private enterprise is pernaps most apparent at MIT. Even so, this pioneering institute has a strict set of rules designed to avoid and resolve "conflicts of interest" which might arise from the direct private-sector funding of research at the institute or the commercial interests and aspirations of academic staff.

Dr Paul Grey, president of MIT, says he believes the end result is beneficial both to the institute and industry. In particular, he believes the relationship "keeps us in touch with the real world."

What is beyond doubt is the major role that the high concentration of academic institutions in the Boston area has had as a breeding ground for new ideas and commercial products. Some estimates suggest that MIT alone has helped directly in the establishment of more than 300 high-technology companies.

Of these, DEC, with an annual revenue of $4.2bn, is the largest. It was founded by Kenneth Olson, MIT graduate. Dr An Wang, the Shanghai-born founder and chairman of Wang Laboratories and inventor of the magnetic core memory, received his doctorate from Harvard.

Spin-offs

These companies have in turn had their own spin-offs. Ed De Castro, Data General's founder and president, who has just completed a major reorganisation of the company management structure, left DEC to start his own company. Data General, which had a revenue of $829m last year, has just reported earnings in its latest quarter of $9m, almost treble those of a year ago.

Mr De Castro predicts that Data General "will be one of the six remaining companies" in the information processing business in the year 2004.

Another key factor in the development of Boston's high tech belt has been the availability of start-up and development capital from both private and public sources, for Massachusetts has perhaps the most advanced and comprehensive set of industrial support and development agencies in the U.S.

Among them is the Massachusetts Industrial Finance Agency, set up in 1978 to assist companies to obtain low cost funds for development through the issue of industrial revenue bonds. So far MIFA has helped to secure $2.3bn in loans, including $402m for 235 projects creating an estimated 19,000 new jobs in high-tech industry.

Under an new programme which is believed to be the first of its kind, MIFA is planning to issue 100 per cent guaranteed fixed-rate long-term bonds in the public credit markets backed by an as yet unnamed major U.S. insurer which would assume 75 per cent of the risk, with the agency assuming the remainder.

Such programmes could go some way towards solving one of the major questions facing Boston and its region. Having attracted a new high-tech industrial manufacturing base can it retain it?

Tax issues

Some industry leaders are already worried that the current Massachusetts state administration of Governor Michael Dukakis may create a less hospitable climate for business. In particular they cite tax issues, including the state's proposed complex unitary tax law provision which would hit those Massachusetts-based high tech companies that have extensive overseas operations and earnings particularly hard. There are alo other planned legislative changes such as new restrictions on plant closures.

If these changes are made, business leaders suggest, some companies may move their operations out of Massachusetts. At the least, they believe they would slow the growth of high-tech industry in the state and

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If these changes are made, business leaders suggest, some companies may move their operations out of Massachusetts. At the least, they believe they would slow the growth of high-tech industry in the state and hasten a new but already apparent trend towards building "second phase" factories elsewhere—often in the southern Sunbelt states.

As Mr Lee of Bank of Boston, says: "Because of the increasingly footloose nature of capital investment, especially in the rapidly changing technology-based industries, the long term growth of the region's economy will require continued co-operation among the business, financial, academic, organised labour and Government communities to maintain the competitiveness of the New England economy, strengthen the links between companies and private capital spending, and provide job opportunities in all parts of the region."

So far the debate on these issues is something of a shadow boxing match. But high-tech industrialists are beginning to flex the political muscles that come with business success and indicate that if the Boston area is to retain its much-prized "Silicon Valley" status then its voice had better be heard.

HIGH TECHNOLOGY EMPLOYMENT IN MASSACHUSETTS

INDUSTRY	EMPLOYMENT						Change (%)
	1976	1977	1978	1979	1980	1981	'76-'81
Drugs	2,079	2,059	2,283	2,694	2,723	2,831	36.2
Ordnance of accessories	4,586	4,921	4,894	5,124	5,447	5,559	21.2
Office of computing and accounting machines	21,386	27,060	31,459	39,116	46,142	48,575	127.1
Electrical and electronic machinery, equipment and supplies	83,800	91,000	98,300	104,000	110,500	111,300	32.8
Guided missiles and space vehicles and parts	11,294	11,819	12,158	12,317	11,647	11,289	—
Miscellaneous transportation equipment	1,872	1,660	1,456	1,113	1,062	1,336	-28.6
Instruments, photographic, medical and optical goods, watches and clocks	45,100	51,500	56,400	57,500	58,500	61,390	35.9
TOTAL	170,117	190,019	206,950	222,464	236,021	242,190	42.4
All manufacturing	593,600	621,100	652,100	672,100	674,900	666,800	12.3
High technology as a percentage of all manufacturing	28.7	30.6	31.7	33.1	35.0	36.3	

Research: Rivka Nachoma.

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